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10/811,621

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EXAMINER

WONG, EDNA

ART UNIT

PAPER NUMBER

1753

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/811,621

Applicant(s)

SHIH ET AL.

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-7,9,12,13 and 17-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7,9,12,13 and 17-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

This is in response to the Amendment dated June 27, 2007. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

Response to Arguments

Claim Rejections - 35 USC § 112

I. Claims **9-16** have been rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The rejection of claims 9-16 under 35 U.S.C. 112, first paragraph, has been withdrawn in view of Applicants' amendment.

II. Claims **9-16** have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claims 9-16 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 102/103

I. Claims **1 and 2** have been rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1).

The rejection of claims 1 and 2 under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Miura et al. has been withdrawn in view of Applicants' amendment.

II. Claims **9 and 10** have been rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1).

The rejection of claims 9 and 10 under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Miura et al. has been withdrawn in view of Applicants' amendment.

III. Claims **17 and 20** have been rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1).

The rejection of claims 17 and 20 under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Miura et al. has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 103

I. Claims **3-8** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1) as applied to claims 1 and 2 above, and further in view of **Willis** (US Patent No. 4,347,108).

The rejection of claims 3-8 under 35 U.S.C. 103(a) as being unpatentable over Miura et al. as applied to claims 1 and 2 above, and further in view of Willis has been withdrawn in view of Applicants' amendment.

II. Claims **11-16** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1) as applied to claims 9 and 10 above, and further in view of **Willis** (US Patent No. 4,347,108).

The rejection of claims 11-16 under 35 U.S.C. 103(a) as being unpatentable over Miura et al. as applied to claims 9 and 10 above, and further in view of Willis has been withdrawn in view of Applicants' amendment.

III. Claims **18 and 19** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1) as applied to claims 17 and 20 above, and further in view of **Willis** (US Patent No. 4,347,108).

The rejection of claims 18 and 19 under 35 U.S.C. 103(a) as being unpatentable over Miura et al. as applied to claims 17 and 20 above, and further in view of Willis has

been withdrawn in view of Applicants' amendment.

Response to Amendment

Claim Rejections - 35 USC § 103

Bath

I. Claims **1-2, 4-7 and 21-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Miura et al.** (US Patent No. 2003/0155247 A1) in combination with **Willis** (US Patent No. 4,347,108) and **Merriam-Webster's Collegiate Dictionary** (© 1997, pp. 1187-1188).

Miura teaches an electrolyte bath, comprising:

(a) an electrolyte solution suitable for metal electroplating (= an electrolytic copper plating solution) [page 2, [0019]]; and

(b) a composition comprising an organic acid (= a complexing agent = an oxycarboxylic acid = citric acid) [page 2, [0023] and [0027]] and a non-ionic surfactant (page 3, [0043]) mixed with said organic acid;

wherein said composition is disposed as a suspension within said electrolyte solution (= the solution contains a complexing agent for the copper ions) [page 2, [0019]].

The organic acid is selected from the group consisting of citric acid and acetic acid (= citric acid) [page 2, [0027]].

The bath of Miura differs from the instant invention because Miura does not disclose the following:

- a. Wherein said non-ionic surfactant is a non-ionic polymer, as recited in claim 1.
- b. Wherein said non-ionic polymer is selected from the group consisting of an alkoxyated alcohol, an alkoxyated amine, and an alkylphenol alkoxyate, as recited in claim 1.

Miura teaches that a wetting agent may be added to the electroplating solution in order to improve wetting characteristics of the article to be plated. Examples of such material include nonionic surfactants (page 3, [0043]).

Like Miura, Willis teaches a copper electroplating bath. Miura teaches that the incorporation of one or more wetting or surface active agents into the additive compositions and acid copper plating baths also results in a copper plating with improved leveling and brightness, and the additive compositions and plating baths exhibit improved stability (col. 5, lines 39-44). The wetting agents include nonionic wetting agents based on ethylene oxide such as alkyl-substituted phenols with excess ethylene oxide (col. 5, line 39 to col. 8, line 46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the nonionic surfactant described by Miura with wherein said non-ionic surfactant is a non-ionic polymer; and wherein said non-ionic polymer is selected from the group consisting of an alkoxyated alcohol, an alkoxyated

amine, and an alkylphenol alkoxylate because a non-ionic polymer of an alkoxylated alcohol, an alkoxylated amine, and an alkylphenol alkoxylate are known nonionic surfactants in the copper electroplating art (col. 5, line 39 to col. 8, line 46).

Incorporating them in a copper electroplating bath would have resulted in a copper plating with improved leveling and brightness, and the electroplating bath would have exhibited improved stability as taught by Willis (col. 5, lines 39-44).

- c. Wherein the suspension is a suspension layer, as recited in claim 1.
- d. Wherein said suspension layer is of sufficient dimension to form a wetting layer on a substrate as said substrate is passed through said suspension layer, as recited in claim 1.

The definition of a "suspension" is *the state of a substance when its particles are mixed with but undissolved in a fluid or solid* (Merriam-Webster's Collegiate Dictionary, pp. 1187-1188).

The suspension as presently claimed would have been the non-ionic polymer mixed but undissolved in the organic acid and the electrolyte solution.

Miura discloses an electrolyte bath composition in a similar manner as instantly claimed. Thus, the suspension in Miura would have been the nonionic surfactant (page 3, [0043]) mixed but undissolved in the organic acid (page 2, [0027]) and electrolyte solution (page 3, [0043] and [0044]).

The suspension in Miura would have been a suspension layer because the

scattering of the nonionic polymer in the organic acid and electrolyte would have formed a heterogenous film/suspension.

Furthermore, the present claims are not claiming that the electrolyte solution and the composition mixture have separate and distinct phases.

e. Wherein said composition is present in said electrolyte solution in a concentration of about 5% by weight, as recited in claim 4.

f. Wherein said organic acid is present in said composition in a wt.% of about 10, and said non-ionic polymer is present in said composition in a wt.% of about 5, as recited in claim 7.

g. Wherein said non-ionic polymer is present in said suspension layer in a quantity of from about 0.5 to about 10 wt.%, as recited in claim 21.

h. Wherein said organic acid is present in said suspension layer in a quantity of from about 2 to about 20 wt.%, as recited in claim 22.

Miura teaches that the complexing agent is used in the concentration range of, for example, 0.05 to 2.0 mol/L (page 3, [0039]). A wetting agent maybe added to the electroplating solution in order to improve wetting characteristics of articles to be plated (page 3, [0043]).

Willis teaches that the amount of the wetting agent which is incorporated into the acid copper plating baths and concentrates of the invention will depend upon the types and amounts of other ingredients in the compositions, but generally from about 0 to

about 5 grams per liter (col. 8, lines 40-46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the composition described by Miura with wherein said composition is present in said electrolyte solution in a concentration of about 5% by weight; wherein said organic acid is present in said composition in a wt.% of about 10, and said non-ionic polymer is present in said composition in a wt.% of about 5; wherein said non-ionic polymer is present in said suspension layer in a quantity of from about 0.5 to about 10 wt.%; and wherein said organic acid is present in said suspension layer in a quantity of from about 2 to about 20 wt.% because the concentrations of the composition, the organic acid and the non-ionic polymer are result-effective variables and one skilled in the art has the skill to calculate the concentrations that would have determined the success of the desired reaction to occur, e.g. if the concentration of the complexing agent is lower than either 0.05 mol/L or the molar concentration of copper ion in the plating solution, the complexing agent cannot keep copper ions in the plating solution in a stable manner, leading to formation of copper precipitation (MPEP § 2141.03 and § 2144.05(II)(B)).

Furthermore, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F.2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1990), *cert.*

denied, 500 US 904 (1991); and MPEP § 2144.

i. Wherein said non-ionic polymer has a molecular weight of less than 1,000, as recited in claim 5.

Willis teaches Carbowax No. 1000 which has a molecular weight ranging from about 950 to 1,050 (col. 6, lines 32-34).

II. Claims **9, 12-13 and 23-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Miura et al.** (US Patent No. 2003/0155247 A1) in combination with **Willis** (US Patent No. 4,347,108) and **Merriam-Webster's Collegiate Dictionary** (© 1997, pp. 1187-1188).

Miura, Willis and Merriam-Webster's Collegiate Dictionary are as applied for the reasons as discussed above and incorporated herein.

Method

III. Claims **17-20 and 25-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Miura et al.** (US Patent No. 2003/0155247 A1) in combination with **Willis** (US Patent No. 4,347,108) and **Merriam-Webster's Collegiate Dictionary** (© 1997, pp. 1187-1188).

Miura teaches a method for electroplating a metal onto a surface in an electroplating electrolyte solution, comprising the steps of:

(a) providing a composition mixture comprising an organic acid (= a complexing agent = an oxycarboxylic acid = citric acid) [page 2, [0023] and [0027]] and a non-ionic surfactant (page 3, [0043]);

(b) forming a suspension of said composition mixture within said electrolyte solution (= the solution contains a complexing agent for the copper ions) [page 2, [0019]];

(c) forming a wetting layer on said surface by passing said surface through said suspension and into said electrolyte solution (= a wetting agent may be added to the electroplating solution in order to improve wetting characteristics of the articles to be plated) [page 3, [0043]]; and

(c) electroplating said metal onto said surface following forming said wetting layer (= small pieces of a silicon wafer with a deposited seed layer were immersed in the plating solutions) [page 4, [0053]; and page 5, [0074]].

The organic acid is selected from the group consisting of citric acid and acetic acid (= citric acid) [page 2, [0027]].

The method further comprises a substrate and wherein said surface comprises a metal seed layer deposited on said substrate (= a silicon wafer with a deposited seed layer) [page 4, [0050]].

The method of Miura differs from the instant invention because Miura does not disclose the following:

- a. Wherein said non-ionic surfactant is a non-ionic polymer, as recited in claim 17.
- b. Wherein said non-ionic polymer is selected from the group consisting of an alkoxylated alcohol, an alkoxylated amine, and an alkylphenol alkoxylate, as recited in claim 18.

Miura teaches that a wetting agent may be added to the electroplating solution in order to improve wetting characteristics of the article to be plated. Examples of such material include nonionic surfactants (page 3, [0043]).

Like Miura, Willis teaches a copper electroplating bath. Miura teaches that the incorporation of one or more wetting or surface active agents into the additive compositions and acid copper plating baths also results in a copper plating with improved leveling and brightness, and the additive compositions and plating baths exhibit improved stability (col. 5, lines 39-44). The wetting agents include nonionic wetting agents based on ethylene oxide such as alkyl-substituted phenols with excess ethylene oxide (col. 5, line 39 to col. 8, line 46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the nonionic surfactant described by Miura with wherein said non-ionic surfactant is a non-ionic polymer; and wherein said non-ionic polymer is selected from the group consisting of an alkoxylated alcohol, an alkoxylated amine, and an alkylphenol alkoxylate because a non-ionic polymer of an alkoxylated alcohol, an alkoxylated amine, and an alkylphenol alkoxylate are known nonionic

surfactants in the copper electroplating art (col. 5, line 39 to col. 8, line 46).

Incorporating them in a copper electroplating bath would have resulted in a copper plating with improved leveling and brightness, and the electroplating bath would have exhibited improved stability as taught by Willis (col. 5, lines 39-44).

c. Wherein the suspension is a suspension layer, as recited in claim 17.

The definition of a "suspension" is *the state of a substance when its particles are mixed with but undissolved in a fluid or solid* (Merriam-Webster's Collegiate Dictionary, pp. 1187-1188).

The suspension as presently claimed would have been the non-ionic polymer mixed but undissolved in the organic acid and the electrolyte solution.

Miura discloses an electrolyte bath composition in a similar manner as instantly claimed. Thus, the suspension in Miura would have been the nonionic surfactant (page 3, [0043]) mixed but undissolved in the organic acid (page 2, [0027]) and the electrolyte solution (page 3, [0043] and [0044]).

The suspension in Miura would have been a suspension layer because the scattering of the nonionic polymer in the organic acid and the electrolyte solution would have formed a heterogenous film/suspension.

Furthermore, the present claims are not claiming that the electrolyte solution and the composition mixture have separate and distinct phases.

d. Wherein said organic acid is present in said composition in a wt.% of about 10, and said non-ionic polymer is present in said composition in a wt.% of about 5, as recited in claim 19.

e. Wherein said non-ionic polymer is present in said suspension layer in a quantity of from about 0.5 to about 10 wt.%, as recited in claim 25.

f. Wherein said organic acid is present in said suspension layer in a quantity of from about 2 to about 20 wt.%, as recited in claim 26.

Miura teaches that the complexing agent is used in the concentration range of, for example, 0.05 to 2.0 mol/L (page 3, [0039]). A wetting agent maybe added to the electroplating solution in order to improve wetting characteristics of articles to be plated (page 3, [0043]).

Willis teaches that the amount of the wetting agent which is incorporated into the acid copper plating baths and concentrates of the invention will depend upon the types and amounts of other ingredients in the compositions, but generally from about 0 to about 5 grams per liter (col. 8, lines 40-46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the composition described by Miura with wherein said composition is present in said electrolyte solution in a concentration of about 5% by weight; wherein said organic acid is present in said composition in a wt.% of about 10, and said non-ionic polymer is present in said composition in a wt.% of about 5; wherein said non-ionic polymer is present in said suspension layer in a quantity of from about

0.5 to about 10 wt.%; and wherein said organic acid is present in said suspension layer in a quantity of from about 2 to about 20 wt.% because the concentrations of the composition, the organic acid and the non-ionic polymer are result-effective variables and one skilled in the art has the skill to calculate the concentrations that would have determined the success of the desired reaction to occur, e.g. if the concentration of the complexing agent is lower than either 0.05 mol/L or the molar concentration of copper ion in the plating solution, the complexing agent cannot keep copper ions in the plating solution in a stable manner, leading to formation of copper precipitation (MPEP § 2141.03 and § 2144.05(II)(B)).

Furthermore, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F.2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1990), *cert. denied*, 500 US 904 (1991); and MPEP § 2144.

RE: REMARKS

Applicants state that Miura et al. fails to teach a non-ionic polymer or a non-ionic polymer mixed with an organic acid or a suspension layer within and electrolyte solution.

In response, Miura teaches that a wetting agent may be added to the

electroplating solution in order to improve wetting characteristics of articles to be plated (page 3, [0043]). A skilled artisan in looking to develop a bath for use at an acidic pH would look at the additives in the prior art for their functioning in an electroplating bath. The skilled artisan would have looked at Willis, who teaches that wetting agents based on ethylene oxide (col. 5, line 39 to col. 8, line 46) are used in acidic copper electroplating baths.

The rejection is not overcome by pointing out that one reference does not contain a particular limitation when reliance for that teaching is on another reference. *In re Lyons* 150 USPQ 741 (CCPA 1966). Moreover, it is well settled that one cannot show nonobviousness by attacking the references individually where, as here, the rejection is based on a combination of references. *In re Keller* 208 USPQ 871 (CCPA 1981); *In re Young* 159 USPQ 725 (CCPA 1968).

The suspension as presently claimed would have been the non-ionic polymer mixed but undissolved in the organic acid and the electrolyte solution.

Miura discloses an electrolyte bath composition in a similar manner as instantly claimed. Thus, the suspension in Miura would have been the nonionic surfactant (page 3, [0043]) mixed but undissolved in the organic acid (page 2, [0027]) and the electrolyte solution (page 3, [0043] and [0044]).

The suspension in Miura would have been a suspension layer because the scattering of the nonionic polymer in the organic acid and the electrolyte solution would have formed a heterogenous film/suspension.

Furthermore, the present claims are not claiming that the electrolyte solution and the composition mixture have separate phases.

Applicants state that Examiner ignores the fact that the disposition or formation of a suspension layer is not a material property, but a physical arrangement of Applicants electrolyte bath, which Examiner has not shown in the prior art.

In response, the suspension as presently claimed would have been the non-ionic polymer mixed but undissolved in the organic acid and the electrolyte solution:

Miura discloses an electrolyte bath composition in a similar manner as instantly claimed. Thus, the suspension in Miura would have been the nonionic surfactant (page 3, [0043]) mixed but undissolved in the organic acid (page 2, [0027]) and the electrolyte solution (page 3, [0043] and [0044]).

The suspension in Miura would have been a suspension layer because the scattering of the nonionic polymer in the organic acid and the electrolyte solution would have formed a heterogenous film/suspension.

Furthermore, the present claims are not claiming that the electrolyte solution and the composition mixture have separate and distinct phases.

Furthermore, the claim limitation of "wherein said composition is disposed as a suspension layer within said electrolyte solution" is not necessarily a positive physical arrangement of the composition because it is open to read as the result achieved. Only the structure implied by "mixed" (recited in claim 1, line 5) and "is disposed" (recited in

claim 1, line 8) defines the electrolyte bath.

How the physical arrangement was obtained does not distinguish the electrolyte bath from the prior art.

The scope of "said composition is disposed" is different from the scope of "said composition disposed".

Applicants state that claims 1 and 9 are clearly drawn to an electrolyte bath (apparatus) and are not product by process claims as the Examiner erroneously asserts.

In response, claims 1 and 9 are composition claims because an electrolyte bath is not a mechanical, power-driven structure (an apparatus).

Applicants state that the Examiner is rejecting Applicants claims based on the broadness of Applicants claims, which is nowhere found in the MPEP or the case law as a legitimate consideration in determining anticipation or obviousness.

In response, it is well settled that unpatented claims are given the broadest, most reasonable interpretation and that limitations are not read into the claims without a proper claim basis therefor. *In re Prater* 415 F. 2d 1393, 162 USPQ 541 (CCPA 1969); *In re Zeltz* 893 F. 2d 319, 13 USPQ 1320.

Applicants state that Examiner has not established that the wetting agents of

Miura et al. (which may be any wetting agent) necessarily would be disposed as a suspension in and electrolyte bath, indeed, Miura et al. does not disclose an electrolyte bath.

Applicants state that the Examiner has provided no legitimate technical reasoning that 'any wetting agent' including a 'non-ionic surfactant' added to the electrolyte solution of Miura et al. would necessarily result in Applicants invention including:

"wherein said composition is disposed as a suspension layer within said electrolyte solution, said suspension layer of sufficient dimension to form a wetting layer on a substrate as said substrate is passed through said suspension layer."

In response, the suspension as presently claimed would have been the non-ionic polymer mixed but undissolved in the organic acid and electrolyte solution.

Miura discloses an electrolyte bath composition in a similar manner as instantly claimed. Thus, the suspension in Miura would have been the nonionic surfactant (page 3, [0043]) mixed but undissolved in the organic acid (page 2, [0027]) and the electrolyte solution (page 3, [0043] and [0044]).

The suspension in Miura would have been a suspension layer because the scattering of the nonionic polymer in the organic acid and electrolyte would have formed a heterogenous film/suspension.

The Patent Office is not equipped to manufacture products put before and then obtain prior art products and make physical comparisons therewith.

Applicants state that "first, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Moreover, any attempt to modify the Miura et al. to achieve Applicants invention would change the principle of operation of the complexing agents of Miura et al. (i.e., to control the pH of the electrolyte during plating) and make the electrolyte of Miura et al. unsuitable for its intended purpose (i.e., restraining the complexing agents in the suspension layer, thereby unable to control the pH of the electrolyte).

"If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious." *In re Ratti*, 270 F.2d 810, 123, USPQ 349 (CCPA 1959).

"If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon*, 733 F.2d 900, 221USPQ 1125 (Fed. Cir. 1984).

Thus, Miura et al. is insufficient to make out a *prima facie* case of obviousness as a matter of law.

In response, the factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The Examiner has set forth the above. The proposed modification or combination of the prior art by the Examiner would not changed the principle of operation of the prior art invention being modified, and would not have rendered the prior art invention being modified unsatisfactory for its intended purpose because:

(a) with regards to the electrolyte bath claims, the operation and intended purpose does not compositionally distinguish the bath from the prior art;

(b) with regards to the method claims, the intended purpose does not compositionally distinguish the method from the prior art; and

(c) the suspension in Miura would have been a suspension layer because the scattering of the nonionic polymer in the organic acid and the electrolyte solution would have formed a heterogenous film, and the scope of "said composition is disposed" is different from the scope of "said composition disposed" in a composition, and the scope of "forming a suspension layer within said electrolyte solution" is different from the

scope of "disposing a suspension layer within said electrolyte solution",

Applicants state that Applicants are not claiming a product by process, which Examiner seems to erroneously assert but are claiming a method/process.

In response, claims 1 and 9 are composition claims because an electrolyte bath is not a mechanical, power-driven structure (an apparatus), and claim 17 is a method claim, and have been treated by the Examiner accordingly.

Applicants state that the Examiner ignores the fact that the formation of a suspension layer is not a material property, and Examiner has cited no support for such a notion.

Applicants state that even assuming *arguendo*, a proper motivation for combination, such combination fails to produce Applicants disclosed and claimed invention including the step of forming Applicants suspension layer within an electrolyte bath.

Applicants again note that disposition of a suspension within an electrolyte bath is not solely dependent on material properties, and the cited reference nowhere disclose or suggest Applicants disclosed and claimed invention including the step of forming Applicants suspension layer within an electrolyte bath.

In response, Miura would have been a suspension layer because the scattering of the nonionic polymer in the organic acid and the electrolyte solution would have

formed a heterogenous film/suspension, and the scope of "said composition is disposed" is different from the scope of "said composition disposed" in a composition; and the scope of "forming a suspension layer within said electrolyte solution" is different from the scope of "disposing a suspension layer within said electrolyte solution" in a method, besides, the scattering of the nonionic polymer in the organic acid and the electrolyte solution would have formed a heterogenous film/suspension layer which is sufficient to form a wetting layer on a substrate as the substrate is passed through it.

Applicants state that Examiner has cited no support for the erroneous proposition that the broadness of Applicants claims somehow preclude patentability, or make Applicants claims obvious, where the elements of Applicants invention including an electrolyte bath with a suspension layer disposed therein or a method of forming a suspension layer and when passing an electroplating surface there through to form a wetting layer thereon prior to electroplating the surface, have not been shown or suggested in the prior art.

In response, if the claims read on the prior art, then the prior art would have made the invention obvious.

An electrolyte bath with a suspension layer disposed therein is not positively recited in the electrolyte bath claims. The scope of "said composition is disposed" is different from the scope of "said composition disposed".

A method of forming a suspension layer reads on the heterogenous scattering of

the nonionic polymer in the organic acid and the electrolyte solution.

Applicants state that Examiners response ignores the elements of Applicants claims and erroneously attempts to shift the burden to Applicants to prove that the prior art would not form a suspension layer. Examiners apparent requirement for a more specific claim including naming a specific organic acid and non-ionic polymer is also erroneous, confusing the broadness of a claim with whether the elements of Applicants claims are disclosed or suggested in the prior art. Applicants respectfully remind Examiner that the burden is on Examiner to show the elements of Applicants claims in the prior art or a suggestion or reason that would lead one of ordinary skill to modify the prior art references to do what Applicants have done. Examiner has shown neither.

In response, the Examiner had always detailed in her Office Actions on how each of the claim limitations read on the prior art.

There is no requirement that the motivation to make the combination be expressly articulated in one or more of the references. The teaching, suggestion or inference can be found not only in the references but also from knowledge generally available to one of ordinary skill in the art. *Ashland Oil v. Delta Resins* 227 USPQ 657 (CAFC 1985). The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin* 170 USPQ 209 (CCPA 19710; *In re Rosselet* 146 USPQ 183 (CCPA 1960). References are evaluated by what they collectively suggest to one versed in the art, rather than by their

specific disclosures. *In re Simon* 174 USPQ 114 (CCPA 1972); *In re Richman* 165 USPQ 509, 514 (CCPA 1970).

The Patent Office is not equipped to manufacture products put before and then obtain prior art products and make physical comparisons therewith.

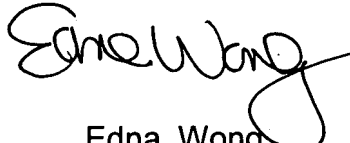
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Edna Wong
Primary Examiner
Art Unit 1753

EW
July 27, 2007